

Quagga and Zebra Mussel Frequently Asked Questions

August 8, 2007

When and where were the quagga mussel larvae discovered in Lake Powell?

The National Park Service has been collaborating with the U.S. Geological Survey, the Arizona Game and Fish Department, the Utah Division of Wildlife Resources, and the Bureau of Reclamation to test for zebra or quagga mussels in Lake Powell. Two separate research and monitoring efforts, conducted on July 19 and 30 have indicated the presence of microscopic quagga or zebra mussel larvae at the Wawheap Marina and near the Glen Canyon Dam.

Five water samples have been collected from Lake Powell and analyzed by a Bureau of Reclamation laboratory in Denver (see table below). The samples were analyzed using two different methods – a microscopic technique and DNA fingerprint technology. Three of these samples did not indicate the presence of any quagga or zebra mussels. Two of the samples, collected at the Wahweap Marina and near the Glen Canyon Dam, indicated the presence of three individual mussel larvae when tested with the microscopic method and confirmed with the DNA fingerprint technology.

The testing methods can not distinguish between quagga and zebra mussels, so it is unknown at this time whether these may be zebra or quagga mussel veligers.

Quagga/Zebra Mussel Test Results as of August 8, 2007:

Sample Date	Location	Microscopic Results	DNA Fingerprint Results	Number of Veligers Detected
July 19	Main Channel near Glen Canyon Dam (sample 1)	Positive	Positive	1
July 19	Main Channel near Glen Canyon Dam (sample 2)	Negative	N/A*	0
July 30	Main Channel near Glen Canyon Dam	Negative	N/A*	0
July 30	Wahweap Marina, south side breakwater	Positive	Positive	2
July 30	Antelope Point Marina Launch Ramp	Negative	N/A*	0

* Note: The DNA fingerprint method has not been done on these negative samples.

What are veligers?

Veligers are the microscopic, larval stage of a quagga or zebra mussel's lifecycle. As the veliger matures, it searches for a firm location within the water to attach itself. If it can find a place to attach, and all other ecological conditions are right (i.e., sufficient food, proper water temperature, etc), it can grow into an adult mussel.

What is the extent of quagga or zebra mussels in Lake Powell?

It is currently unknown how widespread these mussels may or may not be in Lake Powell. Additional samples from Lake Powell have been collected and are being analyzed by

laboratories, and more monitoring will occur in the immediate future. In addition, divers from the National Park Service and its partners will inspect the marina areas to search for mussels.

How long have these mussels been in Lake Powell?

At this time, it is unknown how long these exotic mussels may have been in Lake Powell, or whether or not an established population exists. The testing methods do not indicate whether or not the mussels were alive when they were collected.

What will be the effects of quagga or zebra mussels in Lake Powell?

We're unsure about the long-term effects quagga or zebra mussels will have on Lake Powell, but based on what's happened at other waters across the country, we're concerned about the negative effects they may have. Quagga and zebra mussels are known to attach themselves to structures underwater, such as marina facilities or boats. In other areas, they have fouled boat motors and clogged intake pipes at reservoirs. Quagga and zebra mussels voraciously filter out the phytoplankton and zooplankton from the water, altering the ecological balance of a water body. This can have a negative effect on fish populations.

What are quagga and zebra mussels?

Quagga mussels (*Dreissena bugensis*) and zebra mussels (*Dreissena polymorpha*) are small, freshwater bi-valve mollusks (relatives to clams and oysters) that are triangular in shape with black (or dark brown) and white (or cream) striped markings that appear on its shell. They are the only freshwater mussel in the United States that attaches to hard surfaces.

Where did quagga and zebra mussels come from?

Quagga and zebra mussels are native to the Caspian, Black, and Azov Seas of Eastern Europe. Zebra mussels were first discovered in the U.S. in Lake St. Clair, Michigan, in 1988 and were believed to have been introduced through ballast water discharge from ocean-going ships. Since their initial discovery, zebra and quagga mussels have spread rapidly throughout the Great Lakes and Mississippi River Basin states and other watersheds throughout the eastern and central U.S.

How do quagga and zebra mussels move from one body of water to another?

Typically, quagga or zebra mussel veligers naturally move by drifting on water currents either downstream or within a body of water. Once they mature enough to attach to a hard surface, they generally remain stationary.

Zebra and quagga mussels are most commonly spread from one body of water to another by attaching themselves to boats, which are launched in one lake and then later moved into a different lake. Proper cleaning and drying of boats and all equipment that may have come into contact with the water is the most important step boaters can take to prevent inadvertently spreading mussels. General instructions that all frequent boaters should follow for cleaning boats and other gear to stop invasive aquatic nuisance species is available at www.protectyourwaters.net; detailed instructions are available at http://www.wildlife.utah.gov/quagga/pdf/boat_inspection.pdf

How will the new decontamination stations at Lake Powell be used now?

The National Park Service's quagga and zebra mussel prevention program will remain in place while additional monitoring is done to determine how widespread mussels may be in Lake Powell. Boats that have been in water bodies with known quagga or zebra mussel infestations in the last 30 days will continue to be required to be decontaminated before entering Lake Powell.

As a preventative measure, the National Park Service will also begin requiring any boats that are slipped in Lake Powell to receive a decontamination wash before they exit the park if they are being moved to a non-infested lake.

Do quagga or zebra mussels have any predators?

Quagga and zebra mussels do not have many natural predators in North America. But, it has been documented that several species of fish and diving ducks have been known to eat them. Predation has never been strong enough to control quagga or zebra mussel populations.

What has the Utah Department of Natural Resources done to combat this new threat?

Based on the threat posed by quagga mussels, Mike Styler, executive director of the Utah Department of Natural Resources, put a DNR team together to address the issue. The first step was a DNR policy that provides agencies in Utah with direction on how to lessen the chance that quagga mussels come into the state.

By mid-April 2007, the DNR distributed nearly 250,000 "Zap the Zebra" brochures across Utah, primarily at state parks, private marinas and within National Recreation Areas, including Glen Canyon. Additionally, 6,000 signs and similar sized posters were distributed in July 2007 to these same areas, all of which advise boaters about how to deal with their boat as they leave a water body in order to minimize the inadvertent movement of aquatic nuisance species.

Additionally, the "Zap the Zebra" brochures are in the process of being mailed to all of Utah's nearly 60,000 boat owners. And new boat inspection and decontamination information was developed by the team and posted at:

http://www.wildlife.utah.gov/quagga/pdf/boat_inspection.pdf

What is the purpose for Utah Division of Wildlife Resources' new Aquatic Nuisance Species program?

In response to the quagga and zebra mussel threat, in July 2007 the Utah Division of Wildlife Resources began building a new Aquatic Nuisance Species program, which will increase the agency's staff by nearly 40 personnel (2 coordinators, 5 conservation officers, 5 biologists and 29 technicians) to help interdict and decontaminate boats that may be inadvertently transporting mussels or contain the mussel invasion to Lake Powell.

Where can I get more information about quagga and zebra mussels?

Visit: *www.100thmeridian.org*

Quagga and Zebra Mussel Timeline at Glen Canyon National Recreation Area

1999	Visual monitoring began to look for zebra or quagga mussels.
2001	Substrate monitoring began with 9-15 substrates continuously maintained. ARAMARK begins offering free hot water boat decontaminations at Wahweap, Bullfrog, and Halls Crossing marinas to prevent quagga or zebra mussels from infesting Lake Powell.
May 8, 2003	Glen Canyon National Recreation Area requires any vessels coming from quagga or zebra mussel infested waters within 30 days to be decontaminated before launching in Lake Powell.
2005	Antelope Point Marina opens and begins offering hot water boat washes to prevent quagga or zebra mussels from infesting Lake Powell.
January 6, 2007	Quagga mussels detected for the first time west of the Rocky Mountains in Lake Mead
January 24, 2007	Glen Canyon National Recreation Area hosts public meeting on quagga mussel prevention
Jan. – Feb. 2007	National Park Service, ARAMARK, and Antelope Point divers inspect marina facilities. No sign of quagga mussels detected.
March 30, 2007	Glen Canyon announces expanded action plan to prevent quagga mussels.
May and June 2007	New decontamination stations installed at Wahweap and Bullfrog Marinas.
August 9, 2007	Zebra or quagga mussel larvae detected in Lake Powell.